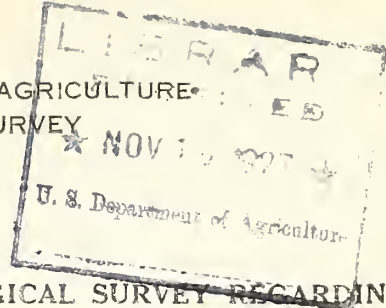


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UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF BIOLOGICAL SURVEYMEMORANDUM FOR FIELD MEN OF THE BIOLOGICAL SURVEY REGARDING  
PRACTICES AND POLICIES IN MATTERS OF BIRD CONTROL

October 26, 1927.

Although experimental work in the control of birds has been delegated to and carried out largely by members of the Division of Food Habits Research, it is realized that field men of other divisions, especially those engaged in mammal control, often come in contact with problems of bird damage and are in position to note the results obtained with the control methods developed and recommended. Continued development of practical and successful control or other crop protection measures against birds depends on the extensive field application of these measures under varied conditions. With its limited personnel, the Division of Food Habits Research is able to do only a little of such work at the present time. Field men of other divisions are urged, therefore, to take note of the results of attempts to protect crops against birds, especially experiments that may indicate the failure of recommended methods or the success of new developments.

From the viewpoint of Bureau policy and procedure there is no objection to the demonstration of bird-control methods or even to the doing of experimental work by those engaged in similar work on mammals, if conditions are favorable and the undertaking will not conflict with or hamper their major lines of work. It is important, however, THAT COPIES OF REPORTS ON ALL WORK OF THIS KIND BE FILED WITH THE DIVISION OF FOOD HABITS RESEARCH IN ORDER THAT ALL INFORMATION BEARING ON BIRD CONTROL MAY BE CENTRALIZED.

The operations of field men in the control of birds should be consistent with the accepted attitude of the Biological Survey toward the various species, based on studies of their economic status. In the case of a number of birds, information bearing on the subject is to be had from published bulletins, but in other instances this is not yet available in printed form. The present memorandum outlines briefly the attitude of the Biological Survey toward birds for which control measures are often requested. References also are made to available published information dealing with their economic status or control.

### Crows

The Biological Survey has consistently opposed indiscriminate, widespread anti-crow campaigns, especially those conducted during the spring months and carried out on a competitive basis. These frequently involve the employment of a large personnel, which from the very nature of the case often can not be limited to persons who may be relied upon to carry out the work with full regard for the welfare of breeding birds of other species. All too frequently such campaigns are suggested and even carried out without a real study of their need and scope having been made. The wisdom of killing large numbers of crows at winter roosts with the expectation that conditions will be improved locally for game birds and poultry is also questioned, since migration tends to move such crow populations northward during the spring months, and the benefits, if any, will be experienced at points farther north.

It is recognized that there are conditions under which crow control is desirable and even necessary, and considerable experimental work to this end has been carried out. There are indications that crows have increased in certain sections, especially in the West and Northwest, and there are local areas elsewhere supporting a crow population too great for the best interests of agriculture and the conservation of game and other bird life. Conditions on individual farms often invite damage by crows annually, and when these conditions are encountered field men should do all in their power to remedy them.

In dealing with creatures whose redeeming qualities at times may overbalance the harm they do, the idea of general control must be put aside. Local conditions and abundance of crows should decide the issue. Consequently, wherever possible some effort should be made to determine the need and extent of control before measures are recommended or undertaken. Suggestions for control are described in Farmers' Bulletin 1102, "The Crow in Its Relation to Agriculture."

### **Magpies**

The magpie, like the crow, has certain redeeming qualities, and is, in fact, the more insectivorous of the two. Control measures should not be recommended without considering this fact. The tendency of magpies to concentrate both during the breeding season and in winter aggravates the possibility of local damage, and often control operations confined to a ranch or two will materially lessen or prevent damage to poultry and livestock in the vicinity. Campaigns against coyotes often must be preceded by a more general reduction in the number of magpies to make poison stations and traps set for coyotes really effective. Control measures against magpies also are warranted in the vicinity of poultry farms, game farms, and bird refuges on which magpies have concentrated. Aid in any widespread reduction of the numbers of magpies, asked for solely on the plea that they are a menace to bird life under natural conditions, should be given only after the need has been demonstrated through an investigation by competent persons, preferably from the Biological Survey. Published information on the magpie appears in Technical Bulletin 24, "The Magpie in Relation to Agriculture," and in Leaflet Bi-729, "Poisoning Magpies."

### **Blackbirds**

Red-winged blackbirds, crow blackbirds or grackles, yellow-headed blackbirds, and less frequently the Brewer and rusty blackbirds and cowbirds inflict damage to corn, milo, rice, oats, cherries, and some other crops. These birds also have redeeming qualities which, in the course of the year, frequently outweigh the harm they do, and for this reason widespread campaigns are not warranted. Furthermore, no really effective and economical means of wholesale reduction of the numbers of these birds has been devised. The frightening effect of poisoning operations conducted locally often will afford local crop protection. Measures of this kind are described in Leaflets Bi-899, "Blackbirds and the Rice Crop on the Gulf Coast," and Bi-908, "Blackbird Control in Cornfields." Recent experimental work also has demonstrated that where it can be used with safety the rifle is more effective and economical than the shotgun as a means of blackbird minding in grainfields. Before inaugurating control measures against blackbirds, State laws should be consulted to determine whether the species involved is protected by law.

## **Starlings**

The European starling is generally looked upon with disfavor, especially by persons who have witnessed this bird drive out native species. The starling does damage to cherries and other fruit and at times is destructive to garden truck. On the other hand, it is one of the most effective bird enemies of ground-insect pests in the Eastern United States, and up to the present time its food habits in this respect have been all that could be desired. In spite of the fact that the bird is not protected in any of the States where it is abundant, local control is recommended to meet complaints of damage. Unfortunately, practically no experimental work has been done other than at roosts mentioned at another point. The highly insectivorous character of the starling's food during spring and early summer militates against the successful use of poisoned baits at that time. Making the diameter of entrances to nest boxes  $1\frac{1}{2}$  inches or less will do much toward restricting the nesting facilities of starlings.

Department Bulletin 868, "Economic Value of the Starling in the United States," is now out of print, and the only published information of the Department now available on the starling is Department Circular 336, "Spread of the European Starling in North America."

## **Pinyon Jays**

The nomadic habits of the pinyon jay prevent material reduction in its numbers over large areas. Directions for local control are contained in Leaflet Bi-667, "Directions for Poisoning Pinyon Jays."

## **English Sparrows**

Because of its tendency to gather in large flocks and congregate in the vicinity of chicken yards, warehouses, experimental plots of grain, and even along the borders of more extensive fields of grain, the English sparrow must be looked upon as a nuisance locally. There may be areas embracing several counties in which the bird at times is so abundant in rural sections that a general reduction in its numbers is advisable. Ordinarily, however, control work confined to the local communities where the birds have proved most troublesome, and in which resident farmers cooperate, will remedy the situation. In the Eastern States the problem of the English sparrow is decidedly a local one, and there is evidence that the bird has decreased in numbers in that area in the past decade. It is not looked upon as the outstanding menace to native birds as it formerly was, although it is still necessary to hold it in check where other hole-nesting species are being fostered. Nestling English sparrows are insectivorous to a marked degree and when abundant exert a controlling influence on certain pests. A case in point is their commendable work against the alfalfa weevil in Utah. The task of examining more than 8,000 stomachs of English sparrows upon which to base a modern appraisal of the bird has been completed in the Division of Food Habits Research.

Measures for the control of the English sparrow, including poisoning and trapping, are given in Farmers' Bulletin 493, "The English Sparrow as a Pest."



## Turkey Buzzards

The Biological Survey has discouraged the general destruction of turkey buzzards and black vultures. It is often contended that these birds are important carriers of livestock diseases, but two investigators working independently have shown that the virus of charbon, or anthrax, is destroyed in passing through the digestive tract of the turkey buzzard, and there also are on record similar data regarding the virus of hog cholera. In addition, experimental work of the Bureau of Animal Industry has indicated that the transmission of hog cholera on the feet of birds is by no means so likely to occur as is generally supposed, and under certain conditions it was found impossible to transfer the disease from sick to healthy hogs through medium of pigeons, even after constant exposure for several weeks.

There are a multitude of possible carriers of livestock diseases other than buzzards --flies and other insects of many kinds, opossums, skunks, chickens, cats, dogs, and even man himself. To eradicate only one of these while others equally potent are allowed to remain will not solve the problem. This is demonstrated by the fact that hog cholera is virulent in northern States out of the ranges of the turkey buzzard and black vulture. For this reason the Biological Survey has not approved general campaigns against buzzards as a preventive of livestock diseases. Strict sanitation and inoculation are more effective.

There are localities, however, in which, through their predatory habits and concentrated numbers, turkey buzzards and black vultures have become a menace to newborn calves, lambs, and kids. Local control under such conditions is warranted. A funnel type of trap of considerable size baited with carrion has been found successful by some southern livestock raisers.

The only published information of the Department now available on the turkey buzzard is a section of Farmers' Bulletin 755, "Common Birds of Southeastern United States in Relation to Agriculture."

## Hawks and Owls

The Biological Survey has consistently opposed indiscriminate campaigns against birds of prey. Although laws now in force in some States restrict the payment of bounties to the scalps of the Cooper and sharp-shinned hawks, the goshawk, and the great horned owl, species known to be destructive to other bird life, this restriction does not work out in practice. County officials, intrusted with the payments of awards, rarely are qualified to identify the remains of hawks and owls offered for bounty, with the result that bounties are paid on many specimens of beneficial species. The use of pole traps also is to be discouraged, since they are more likely to capture the larger mouse-eating hawks and other beneficial species of birds (such as meadow-larks, robins, and mockingbirds) that often alight on some convenient perch, than the swift-flying accipiters that seldom alight before striking.

In areas where damage by hawks is frequent and excessive, the screening of young chicks will in the end prove the most economical. Where it appears that an individual hawk or two with nest near by is to blame, use of the shotgun or the rifle is the most economical and effective recourse.

The only publication of the Department now available on hawks and owls is Circular 61, "Hawks and Owls from the Standpoint of the Farmer," which deals with their economic status. There is available also for field men and their official cooperators for official use, but not for general distribution, a limited supply

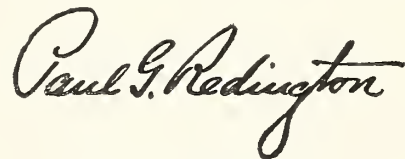
of the following two illustrated publications: "A Plea for Our Hawks," by Edward A. Preble (published by the American Nature Association, Washington, D.C.); and "The Hawks of New Jersey and Their Relation to Agriculture," by Dr. L. A. Hausman (Bulletin 439, N. J. Agri. Exp. Station, New Brunswick, N. J.).

### **Eradication of Objectionable Bird Roosts**

Roosts of birds including such species protected by Federal law as robins and martins, at times become a menace to property and public welfare in residence sections of cities. The bulk of such congregations are composed usually of species not protected by either Federal or State law. Among them are grackles (blackbirds), starlings, English sparrows, and, in some instances, cowbirds. During late summer and early fall tree roosts are occupied, and when cold weather arrives the starlings and English sparrows may resort to church towers, cupolas, ivy-covered walls, or ledges on the sides of buildings protected from rain, snow, and cold winds.

To remedy situations of this kind the Biological Survey has recommended frightening measures in place of efforts directed toward the killing of large numbers of birds. The most effective frightening measures involve the killing of a few birds, but in the case of species protected by law harmless methods should be adopted. No effective way for "gassing" birds roosting in exposed situations has been devised, but experimental work in fumigating them in sheltered or inclosed roosts is now being conducted.

"Methods of Eradicating Objectionable Roosts of Birds" is issued as Leaflet Bi-489.

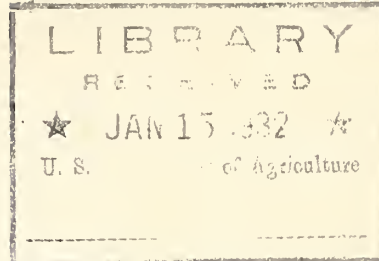


Paul G. Redington  
Chief.





United States Department of Agriculture  
Bureau of Biological Survey  
Washington, D. C.



December 28, 1931.

MEMORANDUM FOR FIELD MEN OF THE BIOLOGICAL SURVEY REGARDING  
PRACTICES AND POLICIES IN MATTERS OF BIRD CONTROL

(Revision of Memorandum dated October 26, 1927)

Experimental work in the control of destructive birds is one of the functions of the Division of Food Habits Research, of the Bureau of Biological Survey. Limitations in funds and personnel, in the past have prevented that division from meeting all requests received for investigation, experimentation, and demonstration in control methods, and field employees of other division of the bureau, particularly those of Predatory-Animal and Rodent Control and of Game and Bird Conservation, have been called upon to assist in meeting local problems. Although these arrangements admittedly were not wholly satisfactory, the obligations of the bureau, in most cases, have been met through this co-operation between its divisions.

Besides men available by detail from the Washington office of the Biological Survey, three employees have been engaged in study of bird control on the Pacific Coast for some time, and during 1931 a western sublaboratory of food habits research, including personnel assignable to bird control, was established at Denver, Colo. Members of other branches of the field force of the bureau will continue to come in contact with bird damage and to receive appeals for relief. These matters will be reported to the chief of the bureau whenever they appear to be of sufficient importance to warrant investigation or remedial action. Field employees and others interested are asked to present in such reports all information obtainable through direct observation, to record the results of local attempts to protect crops against birds, and especially to report any failure of recommended methods or the success of new experimentation.

The general policy of the Biological Survey is to hold bird-control work to the minimum. In individual cases the bureau's policy is to study the situation in the field, with the view of developing preventive and, when necessary and possible, control measures. These services, with subsequent dissemination of information on the results obtained, are considered fulfillment of the bureau's obligations. Large-scale control campaigns and far-reaching extension projects are not con-

templated. The underlying principle recognized is that economic problems involving wild life are characteristically local. Means of solving them must accordingly vary, and their application should be confined to localities where actually necessary. In making adjustments of wild-life relationships for economic reasons, no more should be done than is required for the solution of local problems.

References are made in the following pages to publications of the Department of Agriculture that discuss in detail the economic status and methods of control that have been developed for species that become locally injurious.

### SPECIES PROTECTED BY FEDERAL LAW

Among the birds protected by the Federal migratory-bird treaty act are some that occasionally become injurious. Regulation 10 under the act, authorizing permits to kill migratory birds injurious to property, provides that:

When information is furnished the Secretary (of Agriculture) that any species of migratory bird has become, under extraordinary conditions, seriously injurious to agriculture or other interests in any particular community, an investigation will be made to determine the nature and extent of the injury, whether the birds alleged to be doing the damage should be killed, and, if so, during what times and by what means. Upon his determination an appropriate order will be made.

It will be noted that investigation and proof of serious damage are prerequisite to the issuance of these permits. The orders that have been issued under this regulation, mostly local in scope, have dealt chiefly with fish-eating birds, with robins and band-tailed pigeons in relation to small fruits, with meadowlarks as seed-corn pullers, and with gulls as polluters of reservoirs. The method of destruction specified, which usually is shooting, has been limited as a rule to a stated season, and other restrictions designed to prevent abuse of the permits have been made. Annual reports of operations are required, in default of which the permits may be revoked.

Field men of the Biological Survey working with protected species of migratory birds may take such numbers of specimens as are needed, under authority of a Federal scientific collecting permit and a concurrent State permit.

### Gulls on Reservoirs

It is authoritatively stated that gulls in large numbers may materially increase the count of colon bacilli in reservoirs, and as a result chemical treatment of the water may become imperative. Small reservoirs can be protected by stringing over them crossed wires about 40 or 50 feet apart.

## Fish-eating Birds at Hatcheries

Hatchery ponds usually are small, and in many cases a system of criss-crossed wires can be devised to protect the ponds from fish-eating birds.

## Meadowlarks in Relation to Seed Corn

Repellents for use on seed corn, such as coal tar and red lead, are discussed in Farmers' Bulletin 1102-F, The Crow in Its Relation to Agriculture. If the corn is planted 4 inches deep, or the planted rows are covered to this depth by subsequent cultivation, meadowlarks can not reach the seed.

## Fruit-eating Birds

Small patches of berries and individual fruit trees can be protected from birds by coverings of cord netting. The method is not economical, however, for large-scale use. Cord netting can usually be purchased at not more than 1 cent a square foot. A list of dealers is available from the Biological Survey.

## SPECIES NOT PROTECTED BY FEDERAL LAW

Field men of the Biological Survey are directed to notify the proper State officials of contemplated bird-control work, and in the case of species protected by State law, to obtain in advance the necessary authority to proceed. Care is to be taken also to comply with State and local regulations relative to the use of poisons and firearms and to obtain permission for any exceptions required by the nature of the work.

## Crows

The Biological Survey has consistently opposed indiscriminate widespread anticrow campaigns, especially those carried out on a competitive basis. These frequently involve the employment of a large personnel, which from the very nature of the case often can not be limited to persons who may be relied upon to carry out the work with full regard for the welfare of other species. All too frequently such campaigns are suggested and even carried out without a real study of the need for a determination of their scope. It is of doubtful wisdom to kill large numbers of crows at winter roosts with the expectation that conditions will be improved locally for game birds and poultry, since migration tends to move such crow populations northward during the spring months, and the benefits, if any, will be experienced not locally but at points farther north.

It is recognized that there are conditions under which crow control is necessary and desirable. There are indications that crows have increased in abundance in certain sections, especially in the West and Northwest, and that local areas elsewhere support a crow population too great



for the best interests of agriculture and the conservation of game and other birds. Accordingly considerable experimental work intended to facilitate control has been carried out.

Any idea of general control, however, must be put aside in dealing with birds whose redeeming qualities as insect destroyers at times may over-balance the harm they do. Local conditions and the abundance of the birds should decide the issue in every case. Consequently the local problem should be studied and the necessary extent of control measures determined before they are recommended or undertaken.

Suggestions for crow control are given in Farmers' Bulletin 1102-F, The Crow and Its Relation to Agriculture.

### Magpies

The magpie also has certain redeeming qualities, and is, in fact, more insectivorous than the crow. Control measures should not be recommended without considering the beneficial habits of the bird. The tendency of magpies to concentrate both during the breeding season and in winter increases the possibility of local damage. Frequently control operations confined to one or two ranches will materially lessen or prevent damage to poultry and livestock in the vicinity. Aid in any widespread reduction of the numbers of magpies, asked for solely on the plea that they are a menace to wild life under natural conditions, should be given only after the need has been demonstrated by competent investigators.

Published information on the magpie appears in Technical Bulletin 24, The Magpie in Relation to Agriculture; and in a mimeographed leaflet of the Biological Survey, Bi-729, Poisoning Magpies.

### Blackbirds

Red-winged blackbirds, crow blackbirds or grackles, and yellow-headed blackbirds, and less frequently Brewer's and rusty blackbirds and cowbirds, damage corn, milo, rice, oats, cherries, and some other crops. These birds also have redeeming qualities that, in the course of the year, frequently outweigh the harm they do. For this reason widespread campaigns against them are not warranted. Furthermore, no really effective and economical means of wholesale reduction in the numbers of these birds has been devised for use when they are in wandering bands, which is for the greater part of the year.

Control measures are described in Biological Survey mimeographed leaflets, Bi-899, Blackbirds and the Rice Crop on the Gulf Coast, and Bi-908, Blackbird Control in Cornfields. Trial has demonstrated also that where a small-bore rifle can be used with safety it is more effective and economical than the shotgun as a means of bird minding in grain fields.

## Starlings

The European starling is generally looked upon with disfavor, especially by persons who have known it to appropriate the nesting sites of native species and to inflict damage in orchards and elsewhere. The starling does destroy cherries and other fruits and at times is destructive to garden truck. On the other hand, it is one of the most effective bird enemies of ground-insect pests in the Eastern United States, and up to the present time its food habits in this respect have been all that could be desired. The bird is not protected in any of the States where it is abundant.

Local control is recommended to meet complaints of damage. Unfortunately, practically no experimental work has been done other than at roosts, mentioned at another place in this publication. The highly insectivorous character of the starling's food during spring and early summer militates against the successful use of poisoned baits at that time. The smaller native species can be protected against the encroachments of starlings by the provision of nest boxes having entrances of 1-1/2 inches or less in diameter.

Farmers' Bulletin 1571-F, The European Starling, contains information on the economic status and control of the bird, and Circular 40-C, The Spread of the European Starling in North America (to 1928), gives an account of its introduction, spread, and range.

## Pinyon Jays

The nomadic habits of the pinyon jay usually keep it from being consistently destructive in a given area. Only local control at times of damage is warranted. Suggestions are contained in a Biological Survey mimeographed leaflet, Bi-667, Directions for Poisoning Pinyon Jays.

## English Sparrows

Because of its tendency to gather in large flocks and to congregate in the vicinity of chicken yards, warehouses, experimental plots of grain, and even along the borders of more extensive fields of grain, the English sparrow must be looked upon as a nuisance locally. There may be extensive areas, embracing several counties, in which the bird at times is so abundant in rural sections that a general reduction in its numbers is advisable. Ordinarily, however, control work confined to the local communities where the birds have proved most troublesome, and in which resident farmers cooperate, will remedy the situation. In the Eastern States the problem of the English sparrow is decidedly a local one, and there is evidence that the bird has decreased in numbers in that section in recent years. It is not, as formerly, looked upon as an outstanding menace to native birds, although at times it is still necessary to hold it in check where other hole-nesting species are being fostered. Nestling English sparrows are insectivorous to a marked degree, and as a result during the nesting season



their feeding exerts a controlling influence on certain pests where the birds are abundant. A case in point has been their commendable work against the alfalfa weevil in Utah.

Measures for the control of the English sparrow, including poisoning and trapping, are given in Leaflet 61-L, English Sparrow Control.

### Turkey Buzzards

The Biological Survey has discouraged the general destruction of turkey buzzards and black vultures. These birds have been accused of being important carriers of livestock diseases, but skilled investigators have shown that the virus of charbon, or anthrax, is destroyed in passing through the digestive tract of the turkey buzzard (1), (2). There also are on record similar data regarding the virus of hog cholera. Experimental work of the Bureau of Animal Industry has indicated that the transmission of hog cholera on the feet of birds is by no means so likely to occur as is generally supposed (3). Under experimental conditions it was found impossible to transfer the disease from sick to healthy hogs through the medium of pigeons, even after constant exposure for several weeks.

There are a multitude of possible carriers of livestock diseases other than buzzards--flies and other insects of many kinds, opossums, skunks, chickens, cats, dogs, and even man. To eliminate only one suspected carrier while known carriers equally potent are allowed to remain will not solve the problem. This is demonstrated by the fact that hog cholera is prevalent in Northern States where buzzards are rare. For these reasons the Biological Survey has not approved general campaigns against buzzards as a preventive of livestock diseases. Innoculation and other forms of sanitation are more effective.

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(1) Darling, S. T., and Bates, L. B., Anthrax in Panama, with a note on its probable mode of transmission by buzzards. Amer. Vet. Rev. 42.(1): 70-75, Oct. 1912.

(2) Morris, Harry, Carrion feeders as disseminators of anthrax or charbon. Louisiana Agr. Exp. Sta. Bul. 136: 1-16, 1912.

(3) Dorset, M., McBryde, C. N., and Niles, W. B., Investigations concerning the sources and channels of infection in hog cholera. Journ. Agr. Res. 13 (2): 125-131, Apr. 1918.

There are localities, however, in which, through their predatory habits and concentrated numbers, both turkey buzzards and black vultures have become a menace to new-born pigs, calves, lambs, and kids: Local control under such conditions is warranted. A funnel type of trap of considerable size baited with carrion has been found successful by some southern livestock raisers.

The only published information of the department now available on the turkey buzzard is a section of Farmers' Bulletin 755-F, Common Birds of Southeastern United States in Relation to Agriculture.

#### Hawks and Owls

The Biological Survey has consistently opposed indiscriminate campaigns against birds of prey. Although laws now in force in some States restrict the payment of bounties to Cooper's and sharp-shinned hawks, the goshawk, and the great horned owl, which are species known to be more or less destructive to other bird life, this restriction does not work out in practice. County officials rarely are qualified to identify the remains of hawks and owls offered for bounty, with the result that bounties are frequently paid on beneficial species. The general use of pole traps is to be discouraged, since they are likely to capture not only the larger mouse-eating hawks but also beneficial small birds that are likely to alight on any convenient perch, rather than the swift-flying bird hawks, which seldom alight before striking.

In areas where damage by hawks to poultry is frequent and excessive, the screening of young chicks will prove the most economical in the end. Where it appears that an individual hawk or two with a nest near by is to blame, use of the shotgun or the rifle is the most effective recourse.

The only publication of the department now available on hawks and owls is Biological Survey Circular 61, Hawks and Owls from the Standpoint of the Farmer, which deals with their economic status (4). Recommendations for the control of hawks and other predators on game-propagating establishments are contained in Farmers' Bulletins 1612-F, Propagation of Aquatic Game Birds, and 1613-F, Propagation of Upland Game Birds.

#### OBJECTIONABLE BIRD ROOSTS

Roosts of birds at times become a menace to property and public welfare in cities. These congregations often include robins and purple martins, species protected by Federal law, but the bulk is composed usually of birds protected neither by Federal nor by most State laws. Among them are grackles (crow blackbirds), starlings, English sparrows, and, in some instances, cowbirds. During late summer and early fall tree roosts are

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(4) Two illustrated publications not available for general free distribution are A Plea for Our Hawks, by Edward A. Preble (published by the American Nature Association, Washington, D. C.); and The Hawks of New Jersey and Their Relation to Agriculture, by Dr. L. A. Hausman (Bul. 439, N. J. Agr. Exp. Sta., New Brunswick, N. J.).

occupied, and when cold weather arrives the starlings and English sparrows may resort to church towers, cupolas, ivy-covered walls, or ledges on the sides of buildings.

To remedy situations of this kind the Biological Survey has recommended measures to frighten the birds in place of efforts directed toward killing large numbers of them. The most effective frightening measures involve the killing of a few birds, but in the case of species protected by law, harmless methods must be adopted. No effective way for "gassing" birds roosting in exposed situations has been devised, and in general the method is out of the question because poisonous gases are too dangerous for use in the places where such roosts usually are established. Roosts on ivy-covered walls sometimes can be eradicated by the application of cyanide flakes by a blower, but this also is a dangerous operation, to be undertaken only after full consideration, and then to be carried out with all precautions and under strict supervision.

A mimeographed leaflet of the Biological Survey, Bi-489, Methods of Eradicating Objectionable Roosts of Birds, contains various suggestions on this subject.

*Paul G. Redington*  
Chief.